

What Is Claimed Is:

1. A modem for receiving and transmitting data on a telephone line, said modem comprising:

a transformer having a primary coil and a secondary coil, said primary coil having a plurality of windings, said secondary coil being connected to said telephone line; and

a coder-decoder (CODEC) converting a digital transmit data to an analog transmit signal and transmitting said analog transmit signals using a first set of windings, said CODEC receiving an analog receive signal on a second set of windings and converting said analog receive signal to a digital receive data, said first set of windings and said second set of windings being contained in said plurality of windings, said first set of windings containing a fewer number of windings than said second set of windings.

2. The modem of claim 1, wherein said second set of windings comprises said plurality of windings and said first set of windings comprises a subset of said plurality of windings.

3. The modem of claim 2, further comprising a digital signal processor (DSP) performing signal processing operation on said digital receive data to recover the data encoded on a signal received on said telephone line.

4. The modem of claim 2, wherein said CODEC comprises:
a network transmitting said analog transmit signal using said subset of windings, said network generating a subtraction component representing an echo voltage generated by

4 transmitting said analog transmit signal;
5 an echo cancellation unit receiving said analog receive signal present on said plurality
6 of windings and subtracting said subtraction component from said analog receive signal to
7 generate a signal of interest representing data received on said telephone line;
8 an analog to digital converter (ADC) generating said digital receive data from said
9 signal of interest, wherein said DSP is coupled to receive said digital receive data generated
10 by said ADC; and
11 a digital to analog converter (DAC) converting said digital transmit data to said
12 analog transmit signal.

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4 means for transmitting said analog transmit signal using a first set of windings of a
5 primary coil of a transformer; and
6 means for receiving an analog receive signal using a second set of windings of said
7 primary coil, wherein said first set of windings and said second set of windings are contained
8 in said plurality of windings, said first set of windings containing a fewer number of windings
9 than said second set of windings.

1 9. The modem of claim 8, further comprising:

2 means for generating a subtraction component representing an echo voltage generated
3 by said transmitting; and

4 means for subtracting said subtraction component from said analog receive signal to
5 generate a signal of interest representing data received on said telephone line.

1 10. The modem of claim 9, wherein said second set of windings comprises said
2 plurality of windings and said first set of windings comprises a subset of said plurality of
3 windings.

1 11. A system comprising:

2 a processor sending a digital transmit data and receiving a digital receive data; and
3 a modem sending said digital transmit data on a telephone line, said modem
4 generating said digital receive data based on a signal of interest received on said telephone
5 line, said modem comprising:

6 a transformer having a primary coil and a secondary coil, said primary coil
7 having a plurality of windings, said secondary coil being connected to said telephone

line; and

a coder-decoder (CODEC) converting said digital transmit data to an analog transmit signal and transmitting said analog transmit signals using a first set of windings, said CODEC receiving an analog receive signal on a second set of windings and converting said analog receive signal to a digital receive data, said first set of windings and said second set of windings being contained in said plurality of windings, said first set of windings containing a fewer number of windings than said second set of windings.

12. The system of claim 11, wherein said second set of windings comprises said plurality of windings and said first set of windings comprises a subset of said plurality of windings.

13. The system of claim 12, further comprising a digital signal processor (DSP) performing signal processing operation on said digital receive data to recover the data encoded on a signal received on said telephone line.

14. The system of claim 12, wherein said CODEC comprises:
a network transmitting said analog transmit signal using said subset of windings, said network generating a subtraction component representing an echo voltage generated by transmitting said analog transmit signal;
an echo cancellation unit receiving said analog receive signal present on said plurality of windings and subtracting said subtraction component from said analog receive signal to generate a signal of interest representing data received on said telephone line;

1 20. A method of for transmitting and receiving data on a telephone line, said method
2 comprising:
3 converting a digital transmit data to an analog transmit signal;
4 transmitting said analog transmit signal using a first set of windings of a primary coil
5 of a transformer; and
6 receiving an analog receive signal using a second set of windings of said primary coil,
7 wherein said first set of windings and said second set of windings are contained in said
8 plurality of windings, said first set of windings containing a fewer number of windings than
9 said second set of windings.

1 21. The method of claim 20, further comprising:
2 generating a subtraction component representing an echo voltage generated by said
3 transmitting; and
4 subtracting said subtraction component from said analog receive signal to generate
5 a signal of interest representing data received on said telephone line.

1 22. The method of claim 21, wherein said second set of windings comprises said
2 plurality of windings and said first set of windings comprises a subset of said plurality of
3 windings.